REMARKS/COMMENTS

Claims 1-9 and 16-24 and new Claim 25 are active in the case. Reconsideration is respectfully requested.

Applicants' representative wishes to thank Examiner Kruer for the helpful discussion of the interview that was held on February 1, 2007. As a result of the discussion it is believed that the issues in the case have been clarified and that the prosecution of the case has been materially advanced.

The present invention relates to a method of improving the fracture-mechanical properties of highly scratch resistant, radiation curable coating systems.

Claim Amendments

Claims 1-4, 8, 9, 16, 19, 20 and 23 have been amended in order to clarify the meaning of each claim. New Claim 25 has been added which is directed to a method of protecting and covering a surface of a substrate with the topcoat/elastic coat combination of the present invention. Basis for the claim can be found in the active claims of the application and in the examples of the specification. Neither the amendments to the claims nor the new claim introduce new matter into the case. Entry of the amendments to the claims and the new claim is respectfully requested.

Claim Rejection, 35 USC 112

Substrate (2) in each of Claims 2 and 3 has now been identified as the "second" substrate, and substrate (3) in each of Claims 8 and 20 has now been identified as the "third" substrate. Accordingly, the meaning of each of the amended claims is believed to have been clarified. Withdrawal of the rejection is respectfully requested.

Claim Rejection, 35 USC 103

Claims 1-9 and 16-24 stand rejected based on 35 USC 103 as obvious over Mack et al, U.S. Patent 6,500,883 in view of Otaki et al, U.S. Patent 6,482,489 and Downey, U.S. Patent 3,880,953 or Korpman 4,136,071. This ground of rejection is respectfully traversed.

Mack et al is believed to be completely irrelevant to the present invention, because the field of technology of the patent is unrelated to that of the present invention. Mack et al discloses a polyamide material that is combined with a particulate filler material such as kaolin, mica, wollastonite or the like. The improvement of the patent is the provision of a aminosilane modifier at the interface between the filler particles and the polyamide. This material is said to promote adhesion between the filler particles and the polyamide. The improved polyamide is then ready for use in the fabrication of articles of various shapes by the injection molding process. Obviously, this disclosure is not germane to the multicoat system of the present invention. Further, it does not show or suggest the presently claimed method of providing a surface of a substrate with a scratch-resistant protective hard coat. Withdrawal of the reference is respectfully requested.

The cited Otaki et al patent is also believed to be of limited relevance to the present invention. The patent does not pertain to the field of technology of hard-coat, radiation curable coating systems, but rather is concerned with the bonding of a hologram layer to a substrate where the hologram layer is provided with a protective layer. Suitable substrate materials not only include substances as polyvinyl chloride, polyethylene, acrylic resin, polycarbonate and the like, but also such substrates paper, rubbers, cloth and wood. An important aspect of the disclosure is the provision of a pressure sensitive adhesive material between the substrate and the hologram layer and between the hologram layer and the outer protective layer, thus providing an internally adherent, multi-layered structure. In the multi-

coat system of the present invention there is no pressure sensitive layer material in the multi-layer product that is produced. Rather, an elastic intercoat material which can be the likes of a rubber-containing polymer, a polyacrylate having an appropriate T_g, a polyisobutylene or a thermoplastic elastomer is applied to a surface of a substrate and then a topcoat system of a radiation-curable system is applied directly thereto to complete the layer formation of the laminate, unless an optional pigmented coating layer (E) intervenes. No such structural configuration is taught or suggested by Otaki et al. Since the Otaki et al patent describes a significantly different laminate structure in which a hologram layer is bonded to a substrate by a pressure sensitive adhesive layer and then a protective layer is bonded to the hologram layer by yet another pressure sensitive adhesive layer, it is clear that the two essential steps of the claimed method (Claim 25) of the invention of first applying an elastic intercoat layer to a substrate, and then applying a topcoat system that at least is comprised of a radiation-curable material directly onto the elastic layer is not taught or suggested by the patent

substrate Further, as to the important aspect of the coating structure of the present claims, the provision of an elastic layer (D) between the substrate and the topcoat is not taught or suggested by the reference.

The remaining Downey and Korpman patents are believed to be of secondary interest, since each only discloses a pressure sensitive adhesive formulation, which in the case of Downey is an A-B-A triblock copolymer, wherein A is a non-elastomeric polymer block and B is an elastomeric polymer block, that is mixed with a thermoplastic tackifying resin. In the Korpman patent very similarly an adhesive formulation is described which is a combination of an A-B-A triblock copolymer and an A-B block copolymer is mixed with a tackifying resin. The tackifying agents that are employed in the compositions of the references are essential in imparting pressure sensitive adhesive characteristics to the block copolymer thermoplastics of the references. Clearly, the disclosures of the two patents are irrelevant to

the present invention where no pressure sensitive resin is employed. Accordingly, withdrawal of the rejection is respectfully requested.

Claims 1-9 and 16-24 stand rejected based on 35 USC 103 as obvious over Onozawa et al, U.S. Patent 6,103,370 in view of Matsuoka, JP 0518671 in view of Downey, U.S. Patent 3,880,953 or Korpman 4,136,071. This ground of rejection is respectfully traversed.

The Onozawa et al discloses what is termed a hard coat sheet. The sheet is very simply formed by coating a layer of a resin based composition on a base sheet. Such sheets are described in column 2, lines 8-12, where such resin films as of polyethylene, a terephthalate, a polycarbonate, polypropylene, polyvinyl chloride or the like are described. The resin based composition that is coated on a surface of the base sheet is specifically a radiation curing silicone resin incorporated in an amount ranging from 0.1 to 100 parts by wt into 100 parts by wt of a multi-functional acrylate. This is the two layer structure that is disclosed and claimed in the patent. If desired, the patent at the bottom of column 3, discloses that the "back" side of the base sheet can be provided with an adhesive layer that is formed from the likes of the adhesives described at column 4, lines 3-16. (The adhesive layer does not intervene between a surface of the sheet and the acrylate layer.) This adhesive layer then allows one to apply the sheet to whatever substrate desired, such as a wall in a building or a vehicle. It is therefore abundantly clear that the reference nowhere describes the laminated structure of the present invention in which an elastic intercoat layer is applied to a surface of a substrate and then a coat of at least one radiation curable coating system (F) is applied over the elastic intercoat layer, with an optional pigmented coated layer intervening the coating layer (F) and the elastic intercoat layer.

It is also clear from the discussion above that the Onozawa et al patent does not describe or suggest the method of the invention as set forth in Claim 25 which requires the initial application of an elastic intercoat layer to a surface of a substrate and then the

application of a topcoat layer thereto. Accordingly, the Onazawa et al patent does not describe or suggest the present invention.

The deficiencies of Onazawa et al are neither overcome nor improved by Matsuoka which merely discloses a polycarbonate sheet as a windshield. The disclosure of the engineering plastic as a transparency hardly overcomes the multiple deficiencies of Onazawa et al.

Finally, for the same reasons presented above, the disclosures of pressure sensitive adhesives in the secondary references of Korpman and Downey are not relevant to the present invention, because no such pressure sensitive materials are used in the fabrication of the multicoat system of the present invention, although these disclosures may be of some relevance to the tackifier containing adhesive of Onazawa et al. Accordingly, the outstanding ground of rejection is believed to have been overcome and withdrawal of the rejection is respectfully requested.

Claims 1-7, 9, 17-19 and 21-24 stand rejected based on 35 USC 103 as obvious over Bergh et al, U.S. Patent Publication, 2003/0104245 in view of Van Havenbergh et al, U.S. Patent 5,334,842. This ground of rejection is respectfully traversed.

The Bergh et al '245 publication describes a basically two-layer radiation storage panel comprising a self-supporting or supported phosphor layer in which phosphor particles are dispersed in a polymeric binder, and, adjacent thereto, is a protective layer which contains a white pigment, normally titanium dioxide, having a refractive index greater than 1.6. For the preparation of the phosphor containing layer material, the polymeric materials disclosed in paragraph [0042] are employed as a binder. In other words, the thermoplastic rubbery materials disclosed on page 4, second column of the publication constitute the binder component of the base self-supporting or supported layer which contains phosphor particles, and is not as separate layer of the laminated structure described in the publication. The

rubbery material does not form the equivalent of the elastic layer of the present claims. From this description it is apparent that the reference does not teach or suggest the multi-layer coating system of the present invention. It therefore and consequently does not teach or suggest the method of the present invention of applying an elastic intercoat layer to a substrate followed by a topcoat layer system.

Another important distinction between the reference and the claimed invention is that whereas the image projecting layer is basically comprised of phosphor particles in a binder material, the radiation-curable coating system (F), as a layer does not contain phosphor particles, because it does not have an image exhibiting function, but rather is constituted of the types of polymer or resin material such that when exposed to high energy radiation undergoes sufficient curing or cross-linking so as to form a hard coating. Thus, the reference shows no coating that functions in the ways in which the radiation-curable coating (F) and the elastic layer material (D) function in the present invention. Moreover, the protective top coating material of the reference which is comprised of a radiation curable material of a cross-linkable prepolymer or oligomer and a reactive diluent monomer, including a photoinitiator, must contain white titanium dioxide pigment particles of a specific refractivity. On the other hand, the radiation curable topcoating system (F), that forms a part of the topcoat of the present claims, is not compositionally the same as the protective coating material of the publication. If pigmentation is to be introduced into the laminated structure of the invention, it is accomplished by means of a separate layer or coat (E) that is under the coating system (F) and over the elastic intercoat layer (D).

It is clear from the discussion above that the reference does not describe the method of the invention in Claim 25, because it does not suggest the invention as claimed.

The Van Havenbergh et al patent does not overcome the deficiencies of the Bergh et al publication, because the disclosure of various polymer materials in column 17 as

supporting substrate materials is not the focal point of the present invention. Accordingly, the reference does not overcome the several differences which exist between the present claims and the Bergh et al reference as noted above. The rejection therefore is believed overcome and withdrawal of the same is respectfully requested.

It is believed that the application is in condition for allowance. Early notice to this effect is earnestly solicited.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.
Norman F. Oblon

Frederick D. Vastine
Registration No. 27,013

Customer Number
22850